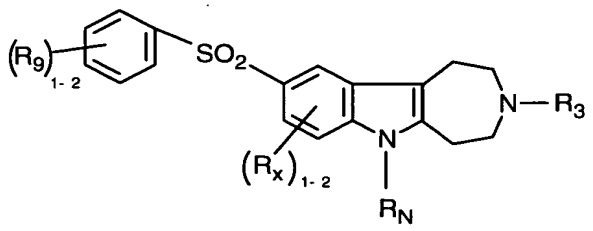
CLAIMS

1. An isotopically labeled compound of formula (X)



(X)

or a pharmaceutically acceptable salt or enantiomer thereof

wherein R_3 is:

(1) -H,

(2) C_1-C_4 alkyl,

(3) C_0-C_4 alkyl-ϕ where -ϕ is optionally substituted with up to 2 of the following:

(a) -F, -Cl, -Br, -I,

(b) -OH,

(c) -OC_1-C_4 alkyl,

(d) -CF_3,

(e) -C≡N,

(f) -NO_2,

where R_N is:

(1) -H,

(2) C_1-C_4 alkyl,

(3) C_0-C_4 alkyl-ϕ where -ϕ is optionally substituted with up to 2 of the following:

(a) -F, -Cl, -Br, -I,

(b) -O-R_{N-1} where R_{N-1} is -H, C_1-C_4 alkyl, and -ϕ,

(c) -CF_3,

(d) -C≡N,

(e) -NO_2,

where R_9 is:

(1) -H,

(2) -F, -Cl,

(3) C_1-C_4 alkyl,

(4) C_1-C_3 alkoxy,

(5) -CF_3,

(6) C_0-C_4 alkyl-ϕ where -ϕ is optionally substituted with up to 2 of the following:

(a) -F, -Cl, -Br, -I,

(b) -O-R_{9-1} where R_{9-1} is -H, C_1-C_4 alkyl, and -ϕ,

(c) $-CF_3$,

(d) -C≡N,

(e) $-NO_2$,

(7) -OR_{9-1} where R_{9-1} is as defined above, and

wherein the compound of formula X has an isotopic label.

2. The compound of claim 1, wherein R_3 is –H and C_1-C_2 alkyl.

3. The compound of claim 2, wherein R_3 is -H.

4. The compound of claim 1, wherein R_N is –H and C_1-C_4 alkyl.

5. The compound of claim 4, wherein R_N is -H, methyl, and ethyl.

6. The compound of claim 1, wherein R_9 is–H, -F, -Cl, C_1-C_3 alkyl, C_1-C_3 alkoxy and $-CF_3$.

7. The compound of claim 6, wherein R_9 is–H, -F, -Cl, C_1 alkyl, C_1 alkoxy, and $-CF_3$.

8. The compound of claim 6, wherein the R_9 substituent is in the 3- or 4-position.

9. The compound of claim 1, wherein the isotopic label is Carbon-11, Nitrogen-13, or Oxygen-15.

10. The compound of claim 1, wherein the compound is:

9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

9-[(4-fluorophenyl)sulfonyl]-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

6-ethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, and

6-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, wherein the compound has an isotopic label.

11. The compound of claim 1, wherein the compound is:

3,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, and

3-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, wherein the compound has an isotopic label.

12. The compound of claim 1, wherein the compound is:

1-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

2-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

4-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

5-methyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

1,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

2,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

4,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole, and

5,6-dimethyl-9-(phenylsulfonyl)-1,2,3,4,5,6-hexahydroazepino[4,5-b]indole,

wherein the compound has an isotopic label.

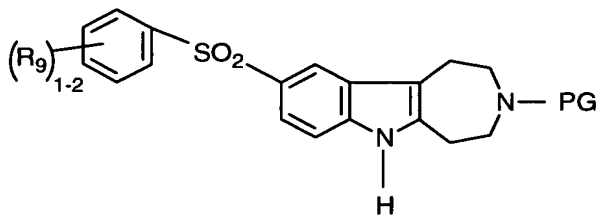
13. Method of performing diagnostic screening comprising: administering a compound of claim 1 to a mammal for incorporation of the isotopically labeled compound into tissue of the mammal.

14. The method of claim 13, wherein the compound is a detectably labeled compound of formula X.

15. The method of claim 13, wherein the diagnostic screening is positron emission tomography.

16. The method of claim 13, wherein the diagnostic screening is single photon emission computed tomography.

17. A protected 9-arylsulfone of formula (VIII)



(VIII)

or a pharmaceutically acceptable salt or enantiomer thereof

wherein PG is:

(1) ϕ-CH_2-,

(2) ϕ-CO-,

(3) ϕ-CH_2-CO_2-, and

(4) -CO-O-$C(CH_3)_3$;

where R_N is:

(1) -H,

(2) C_1-C_4 alkyl,

(3) C_0-C_4 alkyl-ϕ where -ϕ is optionally substituted with up to 2 of the following:

(a) -F, -Cl, -Br, -I,

(b) -O-R_{N-1} where R_{N-1} is -H, C_1-C_4 alkyl, and -ϕ,

(c) -CF_3,

(d) -C≡N,

(e) -NO_2;

where R_9 is:

(1) -H,

(2) -F, -Cl,

(3) C_1-C_4 alkyl,

(4) C_1-C_3 alkoxy,

(5) -CF_3,

(6) C_0-C_4 alkyl-ϕ where -ϕ is optionally substituted with up to 2 of the following:

(a) -F, -Cl, -Br, -I,

(b) -O-R_{9-1} where R_{9-1} is -H, C_1-C_4 alkyl, and -ϕ,

(c) -CF_3,

(d) -C≡N,

(e) -NO_2,

(7) -OR_{9-1} where R_{9-1} is as defined above,

wherein the compound of formula X has an isotopic label.